An Extended Global River Discharge Dataset for the Validation and Closure of the Hydrologic Cycle Within GCMs

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The validation of general circulation model (GCM) hydrologic output is difficult due to the lack of sufficient observational data for quantities which are computed by GCMs. A useful method for model validation is the comparison of observed and computed river discharge from continents. Existing river datasets used by modelers have a limited number (50 - 100) of rivers representing 45 to 50 percent of the total global surface runoff. A number of large rivers are not included in these datasets and some geographical areas are under-represented. Using a number of sources of streamflow data, we have formulated a new dataset consisting of 869 rivers. This dataset represents approximately 71 percent of the total global river discharge. Since most observations are made at gauging stations upstream of the river mouth, actual discharges to the ocean are somewhat higher, but unrecorded. We present this new dataset and several relevant plots indicating levels of significance and variance. This new set of global discharge data will be useful for the validation of climate system models which attempt to fully couple and close the hydrologic cycle.

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